stage of the program; and the detection center is clearly a proper function of the health department.

Of special interest too, to both the health officer and the public health laboratory worker is another article, presented in this issue of the *Journal* describing the cell-smear method of diagnosing cancer developed by Papanicolaou at Cornell Medical College. Papanicolaou quotes the statement that "should every woman over 30 or 40 years of age have periodic smear examinations at regular intervals, mortality from cancer of the uterus would be practically eliminated." This, as he says, is a remote idea; but the opportunities for the public health laboratory in this field are obviously challenging.

It is of some general interest to note the greatly increased rôle of the state health department in the newer phases of our modern public health program. In vital statistics, communicable disease control, sanitary engineering, laboratory service, maternal and child health, venereal disease control, tuberculosis control, and public health nursing, the state coördinates and supplements activities which are now to some considerable extent already in existence at the local level. In industrial hygiene, dental hygiene, mental hygiene, and the control of cancer and other chronic diseases, it has the responsibility of formulating new programs and stimulating activities with which many local health departments have not been concerned in the past.

REFERENCE

1. Editorial. *A.J.P.H.*, 36:1439 (Dec.), 1946.

WHAT SORT OF NATIONAL SCIENCE FOUNDATION DO WE NEED?

WITH respect to the desirability of a major program of federal aid for scientific research, there seems to be no serious dissent. The reports of The President's Scientific Research Board,[1] under the Chairmanship of John R. Steelman, estimates that 1,000 million dollars are now spent for research in the United States (with approximately 100 million in the field of medical sciences). They recommend that the total sum to be increased to one per cent of the national income (nearly 2,000 million); with 300 million allotted to the medical sciences. These recommendations have apparently met with almost universal approval.

The procedure by which the federal government should attack this essential task is, however, the subject of serious difference of opinion—a difference so fundamental as to lead to a veto by President Truman of the Smith Bill creating a National Science Foundation passed by the Congress last summer.

The controversy involves something much more than administrative detail. It implies a fundamental difference in philosophy; and this difference was sharply disclosed in the Magnuson Bill (of which the Smith Bill was an even more extreme form) and the Kilgore Bill—both introduced in the 79th Congress. The essential conflict has been admirably analyzed by a Study Group of the Washington Association of Scientists.[2] The Magnuson Bill (and even more the Smith Bill) "regards science as an auxiliary to the development of industry, medicine, and the national defense; it places complete confidence in the existing organizations and facilities for research and believes that these organizations should further the development of science with a minimum of control by the elected representatives of the people. It would thus simply expand scientific activity in the country by enlarging the

existing structure, concentrating support in well tested organizations and centers if results may be thus more effectively attained. It would place control of the Foundation in the hands of recognized leaders in science, industry, and national defense, insulating it from the people's representatives in the interests of security and immediate efficiency."[2] Under the original Smith Bill authority was vested in a board of 48 unsalaried part-time members who would select an executive committee of nine, who would in turn appoint the Executive Director.

On the other hand, the Kilgore Bill " was based on the premise that science is a national resource, that its raw material is the nation's scientific man power, and that, as a vital national resource, its furtherance should be entrusted to an authority directly responsible to the elected representatives of the people—the Congress and the President. The proponents of this philosophy place primary emphasis upon long-range planning for the whole field of science to insure the development of scientific potential on the widest possible basis throughout the country. They seek guarantees which will deny to special interests a disproportionate influence in formulation of Foundation policy or disproportionate benefits from its activities." The Kilgore school of thought "believes that science has grown to such stature, and is so important for the national well-being, that its management can be left neither to chance nor in the hands of a small group of private citizens serving part-time, no matter how well qualified or well intentioned they may be. Moreover, they feel that an activity which is fundamentally geared with the main drive-shafts of our economic and social life cannot be left free from the normal processes of democratic political control. Recognizing the need for protection of the freedoms of the individual investigator from irresponsible political meddling, they nevertheless would firmly integrate the National Science Foundation in the federal governmental structure. Thus, they would place the direction of the Foundation in a single individual, or at most a small full-time commission, appointed by the President and confirmed by the Senate, and fully responsible to these elected representatives of the people."[2] This is essentially the mechanism by which freedom and responsibility have been so successfully combined in the framework of the Tennessee Valley Authority.

The Magnuson program is attractive to us as scientists in the fact that it provides complete freedom from improper political control; although as citizens, we may be somewhat concerned at the appropriation of large sums of tax money to be spent by a board which has no effective responsibility whatever to our appropriating bodies. Furthermore, it is clear that under the Magnuson plan the 48 members of the Committee would be appointed from the leading representatives of the natural sciences as they are operating today; and that the program would mean great expansion of the types of research now under way in "the development of industry, medicine and the national defense." The fundamental problem to be faced is whether the present distribution of research effort is so completely adequate to meet the fundamental needs of the American people that it should be frozen into a permanent pattern; or, on the other hand, whether some fundamental change in emphasis may not be urgently desirable. This is a problem to be decided by broad scientific and social statesmanship and not by the natural enthusiasm of specialists.

The problem is a many-sided one. It involves, first of all, the areas of knowledge in which research activities should be specially stimulated. Conventional types of laboratory investigation—in chemistry and physics and physiology and clinical medicine—have yielded miraculous results. Exploration in this area of research must be continued and expanded, as will inevitably be the case, under any conceiv-

able program. To many thoughtful persons, however, there seems to be a dangerous lack of balance in the dizzy advancement of physical and physiological science and the static condition of psychological and social science. The perilous state of the world today seems primarily due to the fact that we have learned to make atomic bombs before gaining even an elementary knowledge of the science of international relations. Man has gained vast powers in the control of the physical universe—without corresponding progress in the control of his own emotional motivations.

J. F. Wharton [3] has recently pointed out that "In the quest for peace, we are now trying to build world organizations, economic utopias, and perfectionist educational systems, with very few basic principles to guide us. We are like medieval physicians trying to prevent typhus epidemics before anyone had laid down the principles of the germ theory and demonstrated the effect of an impure water supply. We *may,* by great good luck, hit on the correct solution, but, if we do, it will be better luck than the human race has ever had before." Is it not clear that what we desperately need is stimulation of the psychological and social sciences, the areas of research which lag so far behind those in the simpler and more conventional fields? We might, or might not, attain such a reorientation under the Kilgore Bill. Even our present imperfect knowledge of human nature makes it clear that we could not possibly attain it under the Smith Bill, which would put complete power in the hands of the votaries of the more well established fields.

A serious attack on the wilderness of ignorance in psychology and sociology would necessitate a fundamental change of attitude in regard to the types of research, as well as its general areas. The marvelous results of physical and medical science in the past have been achieved in the laboratory; and, to many, the very word "research" implies balances and test tubes and colonies of guinea pigs or monkeys. *Webster's Dictionary* gives us a broader concept. It defines "research" as "studious inquiry or examination; specifically and usually, critical and exhaustive investigation or experimentation having for its aim the discovery of new facts and their correct interpretation, the revision of accepted conclusions, theories, or laws, in the light of newly discovered facts, or the practical applications of such new or revised conclusions."

Under such a definition, there is room for much more than the conventional laboratory techniques of experimentation with the spectroscope and the inoculating needle. If we are to understand the principles of human behavior and the impacts of social machineries, we must have research outside the walls of the laboratory. We must supplement the results of the laboratory by rigid and scientific study of human reactions and the influences of the social environment, by statistical study, by field experiments and demonstrations. It is precisely this type of research which has been so poorly supported in the past. Millions are available for conventional laboratory research. It is extraordinarily difficult to obtain the most modest sums for the study of such pressing problems as public administration, the hygiene of housing, medical economics in which our own Association is interested—or in the examination of the motivations of men, the principles of government, the bases of sound international relations. A national research program which is to serve the real needs of the American people must rectify this serious inbalance.

The need for reorientation is displayed not only in the areas and types of research, but even in the tools of research. Funds are readily available for the perfection of laboratory methods in physics or chemistry. In the social sciences, however, statistical procedures are the essential and vital tools of research. The *American*

Statistician, published by the American Statistical Association,[4] points out that in the Smith Bill "statistics as an important method for all sciences—natural, physical, and social—was not included, nor was there any provision for inclusion of any of the social sciences." The social sciences "were actually excluded from the Kilgore Bill."

We need—and we shall have—more generous federal support for scientific research in the United States. But a program for this purpose must not be framed to perpetuate and increase the menacing gap between man's control of his physical environment and his control of his emotional reactions and the framework of the society in which he lives. It is rather to narrow this gap that planning of research grants should be designed—if the program is to serve truly the urgent needs of the modern world.

REFERENCES

1. *Science and Public Policy.* (Five Volumes, of which the fifth deals with The Nation's Medical Research.) Reports of The President's Scientific Research Board. U. S. Government Printing Office, 1947.
2. Toward a National Science Policy? Study Group, Washington Association of Scientists. *Science,* 106:385 (Oct. 24), 1947.
3. Wharton, J. F. If We Really Want Peace: Human Principles. *Saturday Review of Literature,* Oct. 25, 1947, p. 9.
4. The National Science Foundation Bill Editorial. *American Statistician,* 1, 2:1 (Oct.), 1947.

"BY HIS TONGUE SHALL YE KNOW HIM"

A BRIEF communication received from a correspondent in Pennsylvania * struck so responsive a chord in the Editorial heart, that it is presented herewith to our readers. Miss Horne—evidently speaking from bitter experience—has this to say, with regard to our profession; all that follows in this editorial being in her words.

The public health worker learns early that he does not work. In other professions people work. But not in public health. There the "worker" *functions, he carries on projects, he promotes activities.* He does not work and he never talks. He would blush with shame if he were ever discovered just talking to people; *he discusses, he confers, he translates, he contacts, he interprets, to other personnel, to other agencies which function in health and social service areas, to the key people, and to the community as a whole.*

He discovers, too, that on beginning a new job his first duty is not to learn about the health of the people he will serve, but to *instigate a survey for the determination of the health needs of the local community. He does research studies and compiles statistics on the local health situation.* To gain support for his work he dare not choose a few good citizens from different social and economic groups, who are interested in the public health; *he seeks out the key people representative of all social and economic levels, who are public-health-minded, to assist him to put across his program.* To report the information he has gathered, to the groups of interested citizens, would be a betrayal of his profession; *he presents significant facts and figures to the responsible local leadership and interprets, correlates, and co-ordinates his findings.* He cannot mention the strong and weak points of the present health conditions; *he presents the total overall picture of the local public health set-up and he indicates what has been accomplished in each program phase and highlights the outstanding achievements.*

* Horne, Marcetta, 317 East Fairview Street, Bethlehem, Pa.